LISTING OF CLAIMS

1. (previously presented) A method for modulating sub-carrier symbols F(k) to an intermediate-frequency OFDM signal (f(n)) having even and odd samples, the method comprising the steps of:

- transforming a number N of the sub-carrier symbols F(k) to pre-processed sub-carrier symbols Z(k) according to the function:

$$Z(k)=\frac{1}{2}\cdot\left[F(k)+F(N-k)^{*}\right]+\frac{1}{2}\cdot j\cdot\left[F(k)-F(N-k)^{*}\right]\cdot e^{+j\pi k/N}$$

with k=0...N-1;

- performing a complex inverse discrete Fourier transformation (IDFT) on the pre-processed sub-carrier symbols Z(k) to generate complex output symbols z(n); and

- transforming the complex output symbols z(n) to the intermediate-frequency OFDM signal (f(n)), by multiplexing the real and imaginary parts of the complex output symbols z(n) into even and odd samples of the intermediate frequency OFDM signal (f(n)).

2. (previously presented) Method according to claim 1 further comprising the steps of:

- assigning the sub-carrier symbols F(k) to a spectrum F(i) with i=0...2N-1 of the intermediate-frequency OFDM signal (f(n)), negative frequency contents being derivable from the symmetry property of spectra of real sequences, $F(i)=F(2N-i)^{*}$;

- converting the sub-carrier symbols F(k), with k=0...N-1, to the pre-processed complex sub-carrier symbols

Z(k) using the symmetry property of spectra of real sequences, wherein Z(k)=X(k)+j*Y(k) with X(k) and Y(k) defining the spectra of real sequences x(n) and y(n); and

- performing the complex inverse discrete Fourier transformation(IDFT) of the pre-processed complex sub-carrier symbols Z(k) into the complex output symbols z(n) = x(n)+j*y(n).

3. (currently amended) Method according to ~~any preceding~~ claim 1, wherein the complex inverse discrete Fourier transformation (IDFT) is performed as an inverse fast Fourier transformation (IFFT).

4. (previously presented) A method for demodulating an intermediate-frequency OFDM signal (f(n)) having even and odd samples to post-processed sub-carrier symbols F(k), the method comprising the steps of:

- transforming the intermediate-frequency OFDM signal (f(n)) to complex input symbols z(n), by de-multiplexing the even and odd samples of the intermediate-frequency OFDM signal (f(n)) onto the real and imaginary parts of the complex input symbols z(n)=x(n)+j*y(n) with x(n)=f(2n) and y(n)=f(2n+1) with n=0…N-1;

- performing a complex discrete Fourier transformation (DFT) on the complex input symbols z(n) to generate complex DFT output symbols Z(k); and

- transforming the complex DFT output symbols Z(k) to the post-processed sub-carrier symbols F(k) according to the function:

$$F(k)=\frac{1}{2}\cdot\left[Z(k)+Z(N-k)^{*}\right]-\frac{1}{2}\cdot j\cdot\left[Z(k)-Z(N-k)^{*}\right]\cdot e^{-j\pi k/N}$$

with k=0…N-1.

5. (previously presented) Method according to claim 4, wherein the complex discrete Fourier transformation (DFT) is performed as a fast Fourier transformation (FFT).

6. (currently amended) Method according to claim 4, ~~one of the claims 4 or 5~~ further comprising the steps of:
- performing the complex discrete Fourier transformation (DFT) of the complex input symbols z(n) into the complex DFT output symbols Z(k)=X(k)+j*Y(k) with k=0…N-1, X(k) and Y(k) being the spectra of the real sequences x(n) and y(n);
- post-processing of the complex DFT output symbols Z(k) with k=1…N-1 to the post-processed sub-carrier symbols $F(k)= X(k)+e^{-j\pi k/N}\cdot Y(k)$ of the intermediate-frequency OFDM signal (f(n)); and
- assigning the post-processed sub-carrier symbols F(k) to an order for further processing.

7. (currently amended) A computer program element comprising program code means for performing the method of claim 1 ~~of any one of the claims 1 to 7~~ when said program is run on a computer.

8. (currently amended) A computer program product stored on a computer usable medium, comprising computer readable program means for causing a computer to

perform the method according to claim 1 ~~any one of the claims 1 to 7~~.

9. (currently amended) An orthogonal frequency division multiplex modulator (1) for modulating sub-carrier symbols F(k) to an intermediate-frequency OFDM signal (f(n)) having even and odd samples, the modulator comprising:

- first transforming means ~~(10)~~ for transforming a number N of the sub-carrier symbols F(k) to pre-processed sub-carrier symbols Z(k), adapted to perform the according to the function:

$$Z(k)=\frac{1}{2}\cdot\left[F(k)+F(N-k)^{*}\right]+\frac{1}{2}\cdot j\cdot\left[F(k)-F(N-k)^{*}\right]\cdot e^{+j\pi k/N}$$

with k=0...N-1;

- IDFT means ~~(4)~~ for performing a complex inverse discrete Fourier transformation (IDFT) on the pre-processed sub-carrier symbols Z(k) to generate complex output symbols z(n); and

- second transforming means ~~(50)~~ comprising a multiplexing means ~~(52)~~ for multiplexing of the real and imaginary parts of ~~for transforming~~ the complex output symbols z(n) into even and odd samples of ~~to~~ the intermediate-frequency OFDM signal (f(n)).

10. (currently amended) Orthogonal frequency division multiplex modulator ~~(1)~~ according to claim 9, wherein the IDFT means ~~(4)~~ exhibits the functionality to perform an inverse fast Fourier transformation (IFFT).

11. (currently amended) Orthogonal frequency division multiplex modulator ~~(1)~~ according to claim 9 ~~one of the claims 9 or 10~~, wherein the first transforming means ~~(10)~~ further comprises:

- assigning means ~~(10a)~~ for assigning the sub-carrier symbols F(k) to a spectrum F(i) with i=0...2N-1 of the intermediate-frequency OFDM signal (f(n)), negative frequency contents being derivable from the symmetry property of spectra of real sequences, $F(i)=F(2N-i)^*$;
- converter means ~~(10b)~~ for converting the sub-carrier symbols F(k), with k=0...N-1, to the pre-processed complex sub-carrier symbols Z(k) using the symmetry property of spectra of real sequences, where $Z(k)=X(k)+j*Y(k)$ with X(k) and Y(k) defining the spectra of real sequences x(n) and y(n).

12. (currently amended) Orthogonal frequency division multiplex modulator ~~(1)~~ according to claim 9 ~~one of the claims 9 to 11~~, wherein the IDFT means ~~(4)~~ is adapted to perform the complex inverse discrete Fourier transformation (IDFT) of the pre-processed complex sub-carrier symbols Z(k) into the complex output symbols $z(n) = x(n)+j*y(n)$.

13. (currently amended) Orthogonal frequency division multiplex modulator ~~(1)~~ according to claim 9 ~~one of the claims 9 to 12~~, wherein the first transforming means ~~(10)~~ and the IDFT means ~~(4)~~ are integrated into one device.

14. (currently amended) An orthogonal frequency division multiplex demodulator ~~(2)~~ for demodulating an

intermediate-frequency OFDM signal (f(n)) having even and odd samples to post-processed sub-carrier symbols F(k), the demodulator comprising:

- third transforming means ~~(13)~~ comprising de-multiplexer means ~~(13a)~~ for de-multiplexing the even and odd samples of the intermediate-frequency OFDM signal (f(n)) onto the real and imaginary parts of the complex DFT input symbols z(n)=x(n)+j*y(n) with x(n)=f(2n) and y(n)=f(2n+1), with n=0…N-1;
- DFT means ~~(14)~~ for performing a complex discrete Fourier transformation on the complex input symbols z(n) to generate complex DFT output symbols Z(k);
- fourth transforming means ~~(15)~~ for transforming the complex DFT output symbols Z(k) to the post-processed sub-carrier symbols F(k), adapted to perform the function:

$$F(k) = \frac{1}{2} \cdot \left[Z(k) + Z(N-k)^*\right] - \frac{1}{2} \cdot j \cdot \left[Z(k) - Z(N-k)^*\right] \cdot e^{-j\pi k/N}$$

with k=0…N-1.

15. (currently amended) Orthogonal frequency division multiplex demodulator ~~(2)~~ according to claim 14, wherein the DFT means ~~(14)~~ exhibits the functionality to perform a fast Fourier transformation (FFT).

16. (currently amended) Orthogonal frequency division multiplex demodulator ~~(2)~~ according to <u>claim 14</u> ~~one of the claims 14 or 15~~, wherein the DFT means ~~(14)~~ is adapted to perform the complex discrete Fourier transformation (DFT) of the complex input symbols z(n) into complex DFT output symbols Z(k)=X(k)+j*Y(k), with

k=0…N-1, where X(k) and Y(k) are the spectra of the real sequences x(n) and y(n).

17. (currently amended) Orthogonal frequency division multiplex demodulator ~~(2)~~ according to claim 14 ~~one of the claims 14 to 16~~, wherein the fourth transforming means ~~(15)~~ further comprises:
- post-processing means ~~(15a)~~ for post-processing of the complex DFT output symbols Z(k), with k=1…N-1, to the post-processed sub-carrier symbols F(k)= X(k)+exp(-j*pi*k/N)*Y(k) of the intermediate-frequency OFDM signal (f(n));
-assigning means ~~(15b)~~ for assigning the post-processed sub-carrier symbols F(k) to an order for further processing.

18. (currently amended) Orthogonal frequency division multiplex demodulator ~~(2)~~ according to claim 14 ~~one of the claims 14 to 17~~, wherein the DFT means ~~(14)~~ and the second transforming means ~~(15)~~ are integrated in one device.